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NPIC/TDS/P-283-67
10 July 1967

MEMORANDUM FOR: Members, Multisensor Working Group

SUBJECT: The Twentieth Meeting of the Multisensor Working Group

1. The Twentieth Meeting of the Multisensor Working Group convened in the Beige Room on 29 June 1967 at 0930 hours. Members participating were:

NAME	DIVISION	POSITION
25X1A [redacted]	TDS	Chairman
	TID	Secretary & Member
	TID	Member
	PAG	Member
	COPE	Member
	DIA	Member
	TDS	Member
	IAS	Member
	CSD	Alternate
	PD	Member
	PD	Alternate
	SS	Member
	PSD	Member
	TID	Observer
	CIA	Observer

Note. This was the last meeting in which [redacted] will participate as a member. The Multisensor Working Group will miss his assistance and hopes he will maintain his interest in the group. A letter of appreciation to [redacted] is attached. 25X1A 25X1A

2. The meeting was brought to order by the Chairman. He stated that the first portion of the meeting would be a briefing by [redacted] TDS/TD and [redacted] on the NPIC Human Factors Program. A synoposis of the briefing is attached. 25X1A 25X1A

3. The Chairman next outlined the sequence of events leading up to the suggestion that the Multisensor Working Group produce for NPIC an Exploitation Systems Requirement Document. He stated that he would like recommendations from the members on how best to approach the problem. [redacted] indicated that whatever proposal is suggested, should be brought before the Production Board by the Chairman. The present plan calls for the Chairman to be responsible for coordinating the efforts of all divisions and staff inputs. 25X1A

Declass Review by NIMA DoD

ORDER 1
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4. The remainder of the meeting was used to review the color report efforts of the NPIC in color photography. With few exceptions all comments were directed toward a critical review of the conclusions and recommendations. Each conclusion was examined as an entity and reworded to obtain unanimous approval.

This effort demanded that more time be spent than was available for the meeting, therefore the meeting was continued over into the afternoon. Those attending the afternoon session were:

25X1A [ ]

At this time the conclusions were unanimously approved except for one PAG footnote, and the recommendations were thoroughly reviewed. Final approval of the revised recommendations was implemented and it was decided that a small group be selected to attempt to consolidate the conclusions. Those named were:

25X1A [ ]

The final review group consisting of [ ] 25X1A
25X1A [ ] met on 5 July. An attempt was made to consolidate the conclusions, however, in order not to change previously approved statements very little adjustments were made. The final color paper is now in final typing and is scheduled for completion the week of 10 July.

4. A special Multisensor Working Group meeting will be held on 12 July at 1000 hours in the TDS Conference Room to hear a briefing by the [ ] 25X1A
25X1A [ ] on a method used by [ ] for the intelligence community 25X1A
to locate Soviet radar targets to within 5 to 10 nautical miles. This information is directly related to future ELINT-PHOTINT correlation.

25X1A [ ]

Chairman, Multisensor Working Group, NPIC

Attachments:
1 -- Letter of Appreciation
2 -- Briefing on NPIC Human Factors Program

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Distribution:
Orig. & 1 -- NPIC/TDS/TPS
2 -- NPIC/TID
2 -- NPIC/SS
2 -- NPIC/OPS
2 -- NPIC/PAG
2 -- NPIC/TDS/DS
2 -- NPIC/PSD
2 -- NPIC/CSD
2 -- NPIC/PD
2 -- NPIC/IPD
2 -- CIA/IAS
1 -- DIA/AP-1P
1 -- NPIC/Tech Adv/DIR
2 -- DDS&T/OSP

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ATTACHMENT #1

NPIC/TDS/P-281-67
7 July 1967

MEMORANDUM FOR: Secretary, Committee on Photographic Exploitation Equipment

SUBJECT: Membership in Multisensor Working Group

1. The Multisensor Working Group has learned with deep regret that, due to the abolition of the National Committee on Photographic Exploitation Equipment, you will no longer participate in our activities.

2. We are well aware of the substantial contribution you have made to our Group, to the Center, and to the intelligence community by your regular attendance at our meetings and by your willingness to share the knowledge you have gained through many years experience in the field of imagery interpretation. You extensive experience, your sincere interest, your rare abilities, and your cooperative attitude will be difficult or impossible to replace.

3. Please accept our warm gratitude for the efforts you have expended on behalf of the Group, and our best wishes for success in your future assignments. Your presence at future Multisensor Working Group meetings will always be welcomed.

/s/

[redacted]

Chairman, Multisensor Working Group, NPIC

25X1A

Distribution:
Orig. -- Addressee
2 -- NPIC/TDS/TPS

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ATTACHMENT #2.

30 June 1967

SUBJECT: Briefing on NPIC Human Factors Program

At 0930 hours in the Beige Room on 29 June 1967, [redacted] 25X1A
Development Staff, Technical Development Staff and Dr [redacted]
Deputy Program Manager, Human Factors Program, [redacted] were 25X1A
invited to brief the Multisensor Working Group on accomplishments and
1967-68 plans for further human factors research in NPIC. [redacted] 25X1A
informed the Group that during Fiscal Year 1967-68, approximately 1500
man hours in PAG and 500 man hours in IAS will be spent on the Human
Factors Contract. Due to this large effort in-house, [redacted] felt 25X1A
the briefing was needed.

25X1A [redacted] began by informing the Group that some of the human
factors work preceding the current major [redacted] Contract was relevant 25X1A
25X1A background for [redacted] plans. He named [redacted] and 25X1A
25X1A [redacted], as the primary
personnel involved in the Center's study of human factors in photo
25X1A interpretation previous to the [redacted] effort.

25X1 Efforts of [redacted], over the past 5 years:
(1) The first effort began in 1962. It resulted in a document entitled

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"An Analysis of Activities of Photo Interpreters in CIA/PID (NPIC)." The purpose of the study was to begin a training course for NPIC P.I.'s. 25X1A [redacted] of CIA/OTR and [redacted] worked closely together to 25X1A develop the training course for PID in an effort to improve and standardize training of P.I.'s. For the first step, it was necessary to break down the behavior patterns of personnel into small segments. In developing any training program, it is essential to first define a final objective. It is necessary to determine what final performance level is desired. 25X1A Therefore, [redacted] and the others who worked with him broke down the P.I. operation into a detailed task analysis and only afterward were able to construct an intensive training course. (2) Shortly after this study of P.I. operations, a requirement was levied by the collectors for a determination of the photographic ground resolution required by interpreters to satisfy their intelligence extraction mission. The first [redacted] effort 25X1 of this kind involved aircraft on actual aerial imagery. It soon became obvious from this study that each of the various aircraft components required a different resolution level for identification. The entire results of this effort are contained in the report, "Aircraft Image Analysis as a Function of Ground Resolution." (3) The next [redacted] study treated 25X1 "The Effects of Stereo Convergence and Obliquity Angles on the Judged Worth of Aerial Photographs." The question of whether or not varying stereo convergence angle affects the interpretability of aerial photographs was to be studied, since as we increase the stereo base, the acquisition cost increases geometrically. This study resulted in the finding that the convergence angle may be reduced from 30^{o} to 10^{o} without any appreciable

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difference in the interpretability of the imagery. The study was done with NPIC P.I.'s and with controlled, terrain model photography. Obliquity was also part of this study, but the conclusion that interpretability is constant from 0° - 30° and decreases from 30° to 60° was subsequently attributed to the fact that scale was decreasing simultaneously as obliquity increased. (4) In a later study designed to correct this influence, scale was held constant while obliquity varied, and it was determined that obliquity has no affect on what the P.I. judges as being the intelligence value of photography. (Due to the many variables involved in photographic acquisition--target type, sun angle, etc. - this result must be qualified and is done so in [ ] joint report with [ ] 25X1A 25X1A "The Judged Worth of Aerial Photographs as a Function of Obliquity Angle with Constant Scale.") (5) The next study was most directly relevant 25X1A to the projected [ ] exploitation. It consisted of the studying of domestic missile site imagery to determine where possible resolution breakpoints might exist. Ground resolutions from [ ] were considered 25X1D and there came a definite breakpoint at about [ ] beyond which better 25X1D quality photography produced no gain in intelligence extraction. This result established a principle only and must not be applied across the board to all targets. Electronic facilities are considered the best candidate for the next target type to be investigated. Intelligence analysts must be the final judges of the point at which resolution reaches diminishing returns. (6) The last [ ] program to be described involved 25X1 the mensuration function. Human and machine error both cause mensuration 25X1A mistakes. [ ], studies considered only the human element. They, along with [ ] assessed the effects of 25X1A such imagery variables as modulation transfer function, edge spread, edge

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polarity, and corner angularity on the accuracy and precision of mensuration. The results of this study included the finding that within a wide operational range, contrast reduction has no effect on photogrammetrist performance. The complete results may be found in the final report entitled, "The Measurement of Photographic Images by Human Operators."

25X1A [redacted]

25X1 [redacted] in two divisions. The First described was last year's effort which he began by saying was a get-acquainted-period

25X1A due to the fact that [redacted] employees for half the time had no clearances and had to work with their own imagery and interpreters and knew little about the actual working conditions at NPIC. He informed the group of the work that has been done in the past year and then began a discussion of the work planned for 1967-68.

25X1A [redacted] explained the purpose of the [redacted] to the Group. In short, that purpose is to improve the Center's operations. He showed VuGraphs, which outlined his briefing. To begin with, he explained

25X1A the four essential areas to be influenced by the [redacted] studies output -- (1) Personnel capabilities; (2) Procedures; (3) Equipment; and (4) Environment.

25X1A [redacted] explained to the Group that last year's work was divided into 4 areas: (1) Analysis; (2) Program Definition; (3) Experimental (Laboratory work); and (4) Application (being the most beneficial to the Center). Along the same lines, he showed next year's plans to include: (1) Analysis; (2) Program Definition; (3) Experimental/Analysis and (4) Application (the only difference being the word Analysis added to the

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3rd area)

A review of the past year's state of art integration effort included:

1. Center Requirements
2. Published Literature
3. On-Going Research
4. Human Factors Design Standards
5. Present Long Range Plans
6. Computerized Bibliography
7. State-of-the-art Summary

25X1A [redacted] then discussed some specifics regarding studies made for the Center:

Color temperature of illuminations as it affects P.I. Performance -

25X1A This study was made at [redacted] using non-Center imagery and their own P.I.'s. It was discovered that color temperature does not affect visual performance of a simulated P.I. task. There was a recommendation

25X1A made, however, from observing the lighting in [redacted] for several changes. It was noticed that the lighting in [redacted] 25X1A causes undue visual fatigue because of the glare produced. It was suggested that the lighting be modified for individual control so that a P.I. can work in an environment most suited to his needs. This lighting system was suggested after much study of the physical makeup of the eye, the causes of strain, etc. Also, the modification of the lighting system was carefully worked out by [redacted] displayed a drawing showing how the new proposed lighting system would work. 25X1A

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Ultrasonic Accommodation Measurement Feasibility - [redacted] said that [redacted] was still looking for a practical means of measuring visual fatigue via some ocular function's monitoring. Although the ultrasonic transducer - contact lens method has been shown feasible, much developmental research is still required before the system could be considered for operational use.

Another study was made to discover how to increase accuracy and completeness of interpreter output via pacing and/or teaming procedures. Pacing experiments were initiated and found to be of no particular help. Teaming up was tried out and found to be of considerable help accuracy-wise. Accuracy was increased when a team pooled agreements. Another effort was brief by having one P.I. go over the material, write annotations and then pass it on to the next member of the team to go over the film again, using the first team member's comments and adding to them, or disagreeing with them and discussing the disagreements. This procedure also increased accuracy to a great extent. [redacted] felt that these studies may be of some definite value to the Center's operational efficiency.

[redacted] outlined the experiments planned for this year, with the main theme being "Retaining Center Efficiency," he told of a planned emphasis on training and explained that part of the work to be done by [redacted] in 1967-68 would be tangible and part non-tangible. The tangible part is to consist of a 15-hour instructional program to supplement the equipment manual for the advanced Zoom 70 rhomboids soon to be delivered. [redacted] will work with the [redacted] on this task. The further plan is to review existing training augment that existing

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training, make recommendations for changes to be made, apply existing training programs where they may be relevant, and create new training applications where warranted.

A mensuration program divided into three areas (1) Mensuration and Analysis; (2) Error Analysis; and (3) Improvement Program Definition was also described. This research will pick up where the previous [redacted] 25X1A work left off.

The image utilization sub-task will treat the question of the value of stereo. Lack of objective data on the one hand and poor experimental 25X1A method on the other have led [redacted] to conclude that even though most studies dictate against stereo use, a really well-run study has not yet been conducted on the subject. Therefore, [redacted] plans to follow the 25X1A outline below and demonstrate stereo's advantages and disadvantages in a more objective manner than heretofore employed:

(1) Evaluate stereo effectiveness for scanning task through interviewing and testing of 50 P.I.'s.

(2) Identify critical stereo factors generalizable to all imagery and recommend exploitation procedures accordingly.

A microstereoscope design study will also be conducted since these instruments have almost never been designed with the human observer, much less the P.I., in mind.

The dual hearts of the Human Factors Program were unfortunately covered only very briefly due to lack of time. The performance measurement 25X1A area was pointed out by [redacted] as pivotal to the whole effort. Without

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some yardstick for the P.I. system, the effects on total output of changes such as new equipment or personnel training cannot be assessed accurately. The [redacted] 25X1A

25X1A proposed by [redacted] will be designed during this coming year. Its implementation is also considered most critical to NPIC's future. By installing this flexible facility in an operational environment, alteration of equipment, procedure, etc., may be evaluated in a controlled but objective manner by the working components themselves. [redacted] successful 25X1A operation will rely heavily upon the aforementioned performance measures development, but once both are realized, the Center's efficiency is certain to be substantiably streamlined.

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CENTER ROUTING SLIP

FROM	DATE
Chairman, MSWG	11 July '67

TO		INITIALS	DATE	REMARKS
DIR				
DEP/DIR				
EXEC/DIR				
TECH ADV				
SPECIAL ASST				
CH/SS				
ASST FOR P&M				
ASST FOR OPS				
ASST FOR PA				
ASST FOR TD				
CH/CSD				
CH/IPD				
CH/PD				
CH/PSD				
CH/TID	X			Attn:
CH/IAS/DDI				
CH/DIA/XX-4				
CH/DIA/AP-IP				
CH/SPAD				
LO/CGS/CIA				
LO/NSA				

25X1A

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IP FM 30 (2-67) DESTROY PREVIOUS EDITIONS